What Is Claimed Is:

1. Dosimeter for detecting high-energy neutron radiation having a neutron converter and a detection element, characterized in that the neutron converter comprises metal atoms (7) which convert the energy of the neutrons to be detected into protons, alpha particles and other charged nuclei in a suitable energy range so that they are detectable.

2. Dosimeter from claim 1, wherein the metal atoms (7) of the neutron converter (3) have an atomic number of Z>15, preferably Z>20.

3. Dosimeter from claim 1 or 2, wherein the neutron converter (3) comprises titanium, chrome, vanadium, iron, copper, wolfram and/or lead atoms.

4. Dosimeter from one of the preceding claims, wherein the metal atoms (7) of the neutron converter (3) are stable in the sense of radioactivity.

5. Dosimeter from one of the preceding claims, wherein the neutron converter (3) contains metal atoms (7) with different atomic numbers.

6. Dosimeter from one of the preceding claims, wherein the neutron converter (3) comprises metal atoms (7) of alloys.

7. Dosimeter from one of the preceding claims, wherein the neutron converter (3) comprises at least two layers (3a, 3b) with metal atoms (7) of different atomic numbers.

8. Dosimeter from claim 1, wherein the neutron converter (3) comprises layers (3a to 3e) with metal atoms (7) where essentially only metal atoms (7a to 7e) with a specific atomic number are included in each layer

9. Dosimeter from one of the preceding claims, wherein the layers (3a to 3e) of the neutron converter (3), viewed from the side of the dosimeter (1)

facing the neutron radiation, contain metal atoms (7a to 7e) with descending atomic numbers.

10. Dosimeter from one of the preceding claims, wherein at least one of the layers (3a to 3e) with metal atoms (7) is configured as metal foil, preferably as rolled metal foil, or polymer foil sputtered with metal.

11. Dosimeter from one of the preceding claims, wherein the sequence of the layers (3a to 3e) with metal atoms (7a to 7e) of different atomic numbers is matched to the energy spectrum of the neutron radiation.

12. Dosimeter from one of the preceding claims, wherein the neutron converter (3), viewed from the side of the dosimeter (1) facing the neutron radiation, has ^{6}Li atoms and/or ^{10}B atoms and/or ^{14}N atoms (9) in front of the detection element (5) – preferably arranged in a thin layer.

13. Dosimeter from one of the preceding claims, wherein at least two dosimeter elements with different metal atoms (7) for measuring the energy and/or angular distribution can be housed in a casing.

14. Dosimeter from one of the preceding claims, wherein the neutron converter (3) has a hydrogenous polymer between the metal atoms (7) and the ^{6}Li atoms and/or ^{10}B atoms and/or ^{14}N atoms (9).

15. Dosimeter from one of the preceding claims, wherein the neutron converter (3) comprises layers where the first layer (3a) facing the neutron radiation contains metal atoms, the second layer (3c) the hydrogenous polymer and the third layer (3b) ^{6}Li and/or ^{10}B and/or ^{14}N atoms (9).

16. Dosimeter from one of the preceding claims, wherein the neutron converter 93) has fields (N1, N2, N3) with different structures arranged spatially next to each other.

17. Dosimeter from one of the preceding claims, wherein a number of dosimeter elements (1a to 1h) can be arranged preferably symmetrically

on the surface of a cone in order to carry out a local dosage measurement and a directional distribution measurement.

18. Dosimeter from one of the preceding claims, wherein a number of dosimeter elements can be arranged on a phantom in order to carry out a directional measurement.

19. Dosimeter from one of the preceding claims, wherein the detection element (5) comprises at least one passive element and/or at least one active element.

20. Dosimeter from one of the preceding claims, wherein the passive element comprises organic high-molecular polymer, preferably polycarbonate or cellulose nitrate (preferably C39 or macroful), and/or an inorganic crystal and/or mineral, preferably a thermoluminescent crystal, in particular LiF, and/or inorganic glasses and/or an inorganic crystal.

21. Dosimeter from one of the preceding claims, wherein the active element has a semi-conductor, preferably silicon.

22. Dosimeter from one of the preceding claims, wherein provision is made for a photon dosimeter.

23. Dosimeter from one of the preceding claims, wherein the converter layers and the detection element can be housed in a casing which has a front and back wall and side walls.

24. Dosimeter from one of the preceding claims, wherein the side walls contain borium, and/or cadmium and/or nitrogen (^{14}N) and/or lithium atoms (^{6}Li).